Shaily Desai

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Education

Savitribai Phule Pune University — Pune, India
Bachelor's of Engineering(B.E), Computer; ***GPA: 9.01/10*** — *2018 - 2022*

- **Relevant coursework:** Engineering Mathematics(Calculus I & II), Object Oriented Programming, Advanced Data Structures, Machine Learning, Data Analytics, Theory Of Computation, Computer Networks, High Performance Computing

Research Experience

Laboratory for Computational Social Systems, (IIT Delhi - IIIT Delhi) — New Delhi, India
Research Associate — *August 2022 – Present*

- **Combating Online Hate Speech:** Lead a team of 4 on the Counterspeech Generation project sponsored by Logically.ai, U.K.
- Experimented and evaluated previous state-of-the-art models like DialoGPT, GeDi, and other Generative Models.
- Proposed a novel problem statement, *Intent-Conditioned Counterspeech Generation* - and curated the first diversified dataset for the same.
- Designed and developed a two phased Variational Auto-Encoder based model for generation, while also incorporating community-specific information, outperforming prior baselines by an average of **+10%** across 5 evaluation metrics.
- Currently working on two new project threads in the same domain: Controlled Counterspeech Generation and Multi-Turn Dialogue systems for counter-narratives.

Publications

1. ***Counterspeeches up my sleeve!* Intent Distribution Learning and Persistent Fusion for Intent-Conditioned Counterspeech Generation.** *Under Review at ACL 2023.*
2. **Combining Context-Free and Contextualized Representations for Arabic Sarcasm Detection and Sentiment Identification.** *EACL 2021 WANLP*
   A. Hengle, A. Kshirsagar, **S. Desai** and M. Marathe. [Link]
3. **Leveraging Emotion-Specific features to improve Transformer performance for Emotion Classification.** *ACL 2022 WASSA*
   S. Desai, A. Kshirsagar, A. Sidnerlikar, N. Khodake, M. Marathe[Link]
4. **Multitask Finetuning for Improving Neural Machine Translation in Indian Languages.** *Preprint*
   S. Desai, A. Kshirsagar, M. Marathe[Link]

Projects

Intent Conditioned Counterspeech Generation

- Introduced a novel task in combating online hate - intent-specific counterspeech generation. Tagged and extracted intents from previously existing datasets and annotated it further to curate the *IntentCONAN Dataset*.
- Proposed a novel pipeline for the same - initially jointly learning syntax and semantics through vector quantized representations for each class, leveraging them further along with a persistent fusion mechanism to generate diverse counterspeeches. *Code and Dataset to be released*

Hybrid Transformer for Sarcasm Detection in Arabic | *GitHub*

- Infused contextual and static word vectors to detect irony and sentiment in the Arabic language. This project was part of a submission to the ArSarcasm shared task at EACL 2021.
- Our system achieved a F1 score of 0.62 and a F-PN score of 0.715 for the sarcasm and sentiment detection tasks respectively, placing our team **2nd.**

Fusing Representations for Empathy Classification

- As part of a submission to the WASSA shared task at ACL 2022, we proposed a fusion of several text representations to increase the performance of the RoBERTa model on emotion classification.

- Experimented effectiveness of concatenating several emotion-specific features: scores from the NRC lexicon, emotion enriched word embeddings, along with transformer representations.
- Task specific representations achieved an improvement of 9% in the accuracy and 8% in the F1 score over vanilla baselines.

Finetuned Transformer for Translating Indian Languages

- Explored a low-resourced multi-task learning setup for the fine-tuned multilingual BART transformer model.
- Utilized monolingual data in an auxiliary Causal Language Modeling objective to improve performance on Bilingual Translation.
- Conducted experiments on six combinations of language pairs, and observed an increase in BLEU score over two points over baselines after using a mere 70k sentence parallel data for the auxiliary task.

Summer Internship at Celebal Technologies, Pune

- Built an Optical Character Recognition (OCR) based text scanner.
- Tested various models and Computer Vision libraries (PyTesseract, PyImageSearch), and deployed the model in a web-based interface using JavaScript and CSS.

Brain Tumor Segmenter

- Built a Brain Cancer Segmenter web application as part of my final year undergrad project. Studied and compared models such as the vanilla U-Net, MSU-Net, E1D3 U-Net and nn-UNet.
- Trained the nn-UNet model on the BrATS Dataset on Google Cloud GPU. Technologies used: PyTorch, Flask, React Js, Firebase, Monai.

Leadership/Volunteer Experience

International Conference on Natural Language Processing (ICON 2022) *Organizing Team(2022)*

- Organizer and reviewer for the main track papers at ICON, indexed in ACL.

PVG's AI CLUB *Founder: July 2021 - Present*

- 35 member club backed by HOD and an assistant professor, founded to develop an active research community at the college, which enhanced the learning environment for second and third year students.
- Designed a research track and a learning track within the club based on the students' objectives, and conducted weekly code walkthroughs and concept sessions with all students.

TEDxPVGCOET *Lead Organizer and Licensee: 2021-22, Editorial Team: '20, Curation Team: '20*

- Was involved in the organization, editorial and curation of two TEDx events - TEDxPVGCOET 2021, which featured Avant-Garde artists(POC for keynote speaker, and host.)
- TEDxKothrud "COUNTDOWN" event held in conjunction with the local student community of Pune, which aimed to spark a conversation on Climate Change and Environmental issues faced by the world today.

Entrepreneurial Development Cell(EDC) *Management Team(2019-20)*

- Event Management team for PVG's Entrepreneurship cell, and organizer for the annual event "THRUST" which showcased Pune's best entrepreneurs and startup CEOs in a series of talks..

Skills

Programming Languages: Python, C, C++, Java, SQL

Frameworks: Tensorflow, PyTorch, Keras, Huggingface, Scikit Learn, JAX.

Deployment and other Tools: Git, LaTeX, MLflow, Google Cloud Platform, Flask, Docker, Streamlit.